

**UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA**

ARCTIC CAT INC.,

Civil No. 12-2692 (JRT/LIB)

Plaintiff,

v.

**MEMORANDUM OPINION AND
ORDER CONSTRUING
CLAIM TERMS**

BOMBARDIER RECREATIONAL
PRODUCTS INC., and BRP U.S. INC.,

Defendants.

Niall A. MacLeod, **KUTAK ROCK LLP**, 220 South Sixth Street, U.S. Bank Plaza South, Suite 1750, Minneapolis, MN 55402, and Annamarie A. Daley, **JONES DAY**, 100 South Fifth Street, Minneapolis, MN 55402, for plaintiff.

Robert K. Goethals, **LOCKE LORD LLP**, Three World Financial Center, New York, NY 10281, and Kevin D. Conneely, **STINSON LEONARD STREET LLP**, 150 South Sixth Street, Suite 2300, Minneapolis, MN 55402, for defendants.

Plaintiff Arctic Cat Inc. (“Arctic Cat”) and Defendants Bombardier Recreational Products Inc. and BRP U.S. Inc. (collectively “BRP”) manufacture snowmobiles and other all-terrain vehicles. Arctic Cat brought this patent infringement action against BRP, alleging that BRP infringed on four of its patents relating to Arctic Cat’s “two-stroke” engine technology. BRP has counterclaimed for a declaratory judgment of invalidity and non-infringement of each asserted patent. The parties now move the Court to construe disputed claim terms.

BACKGROUND

This patent infringement action arises out of four patents owned by Arctic Cat – U.S. Patent No. 6,237,566 (“the ‘566 patent”), U.S. Patent No. 6,371,082 (“the ‘082 patent”), U.S. Patent No. 6,550,450 (“the ‘450 patent”), and U.S. Patent No. 7,258,107 (“the ‘107 patent”). The patents-in-suit relate to Arctic Cat’s “two-stroke” engine technology, which uses sensed exhaust gas temperatures and other variables to regulate ignition timing and/or fuel injection.

I. OVERVIEW OF TWO-STROKE ENGINE TECHNOLOGY

The engine cycle for an internal combustion engine involves four steps: air intake, compression, expansion, and exhaust discharge. In a two-stroke engine, these steps occur in two “strokes” – a compression stroke and a power stroke. The compression stroke occurs as the piston moves up within the cylinder of the engine. During this upward movement, fuel is injected into the cylinder, air enters the cylinder through an intake port, and the resulting fuel-air mixture is compressed. The power stroke occurs immediately after the compression stroke, as the piston moves back down. The power stroke commences after the firing of the ignition source, usually a spark plug.¹ This firing causes the compressed fuel-air mixture to combust, which produces a heat release that expands and drives the piston downward, starting the power stroke. Gases generated from combustion are then discharged through an exhaust port connected to the cylinder.

¹ The moment in time when the ignition source fires is referred to interchangeably within this Order as the “ignition timing point,” the “ignition point,” or the “ignition timing setting.”

A defining characteristic of a two-stroke is that air intake and exhaust discharge occur simultaneously – air is drawn into the cylinder at the same time that exhaust gas is discharged. Altogether, the up and down piston movement within the cylinder – the compression stroke, followed by the power stroke, followed by the compression stroke, and so on – supplies power to the crankshaft, which in turn supplies power to whatever the engine is driving.

II. ‘566, ‘082, AND ‘450 PATENTS

The ‘566, ‘082, and ‘450 patents come from the same patent family, deriving from U.S. Patent Application No. 09/452,657 (the “‘657 parent application”). (Decl. of Niall A. MacLeod (“MacLeod Decl.”), Ex. A (“‘082 Patent”), Ex. B (“‘450 Patent”), Ex. C (“‘566 Patent”), Dec. 8, 2015, Docket No. 233.) All three patents have the same title – “Two-Cycle Engine With Exhaust Temperature-Controlled Ignition Timing” – as well as the same inventor, Greg Spaulding. (*Id.*) The ‘566 patent issued first, on May 29, 2001, from the ‘657 parent application. (‘566 Patent at 2.) The ‘082 patent issued second, on April 16, 2002, from U.S. Patent Application 09/568,449 (the “‘449 application”), which is a continuation-in-part of the ‘657 parent application. (‘082 Patent at 2.) And the ‘450 patent issued third, on April 22, 2003, from U.S. Patent Application 10/123,773, which is a continuation of the ‘449 application. (‘450 Patent at 2.) (*Id.*) All three patents describe a two-stroke engine that controls ignition timing based on sensed exhaust gas temperatures.

III. THE ‘107 PATENT

The ‘107 patent is entitled “Temperature-Controlled Fuel Injection System for Two-Stroke Engines,” and was issued on August 21, 2007. (MacLeod Decl., Ex. D (“‘107 Patent”) at 2.) The inventors are Daniel J. Johnson, Kim Chervvestad, and Greg Spaulding. (*Id.*) The patent describes a two-stroke engine that controls fuel injection timing based on sensed exhaust gas temperature, crankshaft velocity, and throttle position. (*Id.* at 6, col. 1:49-col. 2:11.)

IV. PROCEDURAL HISTORY

Arctic Cat commenced this patent infringement action on October 19, 2012, alleging that BRP infringed on the four patents described above.² On January 10, 2013, BRP filed counterclaims for a declaratory judgment of invalidity and non-infringement for each asserted patent. A claim construction hearing was originally scheduled for January 22, 2015, but the Court stayed the case after Arctic Cat filed a complaint with the International Trade Commission (“ITC”) covering three of the four asserted patents. A claim construction hearing before the ITC was held on April 8, 2015, but before the presiding administrative law judge could issue a claim construction order, Arctic Cat voluntarily dismissed the ITC litigation. This Court then dissolved the stay and the action recommenced. On August 17, 2015, the parties submitted letter briefs to the Court

² The complaint also alleged infringement of a fifth patent, the ‘203 patent. However, that claim was dismissed by stipulation on January 20, 2015. (Stipulation of Dismissal, Jan. 20, 2015, Docket No. 211.)

seeking guidance on the number of claims requiring construction. The Court issued an order instructing the parties that it would construe the eight claim groupings outlined in BRP's letter brief.

ANALYSIS

I. STANDARD OF REVIEW

Claim construction is a question of law exclusively for the Court. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996). “The purpose of claim construction is to determine the meaning and scope of the patent claims that the plaintiff alleges have been infringed.” *Every Penny Counts, Inc. v. Am. Express Co.*, 563 F.3d 1378, 1381 (Fed. Cir. 2009). Claim terms and phrases “are generally given their ordinary and customary meaning” as understood by one of ordinary skill in the art at the time of the invention.³ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). However, there are “two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (citing *Vitronics*, 90 F.3d at 1580). In construing claims, the Court first looks to the intrinsic

³ The parties agree that a person of ordinary skill in the art is someone with an engineering/bachelor's degree in mechanical engineering plus two years of experience in the art.

evidence, which includes the claim language, the specification, and the prosecution history. *Vitrionics*, 90 F.3d at 1582.

The claim language “provide[s] substantial guidance as to the meaning of particular claim terms.” *Phillips*, 415 F.3d at 1314. The context of the surrounding words may be instructive as to the ordinary and customary meaning of the term. *Id.* The Court also considers “[o]ther claims of the patent in question, both asserted and unasserted.” *Id.* (citing *Vitrionics*, 90 F.3d at 1582). “Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims.” *Id.* Differences among claims can also be a useful guide, because “different words or phrases used in separate claims are presumed to indicate that the claims have different meanings and scope.” *Seachange Int’l, Inc. v. C-COR Inc.*, 413 F.3d 1361, 1368 (Fed. Cir. 2005) (citations omitted) (quoting *Karlin Tech. Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 971-72 (Fed. Cir. 1999)).

”[C]laims ‘must [also] be read in view of the specification, of which they are a part.’” *Phillips*, 415 F.3d at 1315 (quoting *Markman*, 52 F.3d at 979). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Id.* (quoting *Vitrionics*, 90 F.3d at 1582). The specification “may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess” or it “may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor.” *Id.* at 916. However, “the patentee need not ‘describe in the specification every conceivable

and possible future embodiment of his invention.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (quoting *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1344 (Fed. Cir. 2001)). Moreover, “it is improper to read limitations from a preferred embodiment described in the specification – even if it is the only embodiment – into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited.” *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1327 (Fed. Cir. 2012) (quoting *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1342 (Fed. Cir. 2010)).

Finally, the Court construes claims in context of the prosecution history. *Biogen Idec, Inc. v. GlaxoSmithKline LLC*, 713 F.3d 1090, 1094 (Fed. Cir. 2013). The prosecution history “consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent.” *Phillips*, 415 F.3d at 1317. The prosecution history can inform “the meaning of the claim language by demonstrating how the inventor understood the invention.” *Biogen Idec*, 713 F.3d at 1094 (quoting *Phillips*, 415 F.3d at 1317). Further, “when the patentee unequivocally and unambiguously disavows a certain meaning to obtain a patent, the doctrine of prosecution history disclaimer narrows the meaning of the claim consistent with the scope of the claim surrendered.” *Id.* (citing *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003)). However, because the prosecution history “often lacks the clarity of the specification . . . [it] is less useful for claim construction purposes.” *Phillips*, 415 F.3d at 1317.

Although the claim language, specification and prosecution history are of primary importance in construing claims, the Court may also in certain instances consider extrinsic evidence. *Id.* Extrinsic evidence “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Id.* (quoting *Markman*, 52 F.3d at 980). But while “extrinsic evidence ‘can shed useful light on the relevant art,’ . . . it is ‘less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’”” *Id.* (quoting *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 862 (Fed. Cir. 2004)). Thus, “when the intrinsic evidence is unambiguous, it is improper for a court to rely on extrinsic evidence.” *CAE Screenplates Inc. v. Heinrich Fiedler GmbH & Co. KG*, 224 F.3d 1308, 1318 (Fed. Cir. 2000) (citing *Vitrionics*, 90 F.3d at 1583).

II. CLAIM CONSTRUCTION

A. “Ignition Pattern”

The parties first dispute the meaning of the claim term “ignition pattern.” This term appears in multiple claims throughout the ‘566, ‘082, and ‘450 patents. Arctic Cat argues that all three patents expressly define the term as a “relationship between ignition timing and engine speed.” BRP, on the other hand, argues that the term should be construed as “a predefined set of at least two ignition timing settings that vary exclusively based on engine speeds.” Both parties assert that their proposed construction should apply to all usages of “ignition pattern” across the three patents. The Court, however, will decline to provide such an all-encompassing construction. The intrinsic evidence

unique to each patent suggests that “ignition pattern” does not have a completely uniform definition. The Court will thus construe “ignition pattern” individually within each patent.

1. “Ignition Pattern” in the ‘566 Patent

The term “ignition pattern” (or “ignition patterns”) appears in independent Claims 1 and 8, and dependent Claims 5, 6, 12, and 13 of the ‘566 patent. As an initial matter, given that “claim terms are normally used consistently throughout the patent” and there is nothing to indicate that ignition pattern was intended to have multiple meanings within the ‘566 patent, the Court will provide a single construction. *Phillips*, 415 F.3d at 1314.

Arctic Cat’s proposed construction is premised on the argument that “ignition pattern” is expressly defined within the patent. *See Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (holding that patentee may “set[] out a definition and act[] as his own lexicographer”). The Court, however, is not persuaded. While it is true that both the claim language and the specification describe “ignition pattern” as a “relationship between ignition timing and engine speed” (*see* ‘566 Patent at 11, col. 1:38-42; *id.* at 13, col. 6:38-41), both sources also provide other descriptions. Claims 1 and 8, for example, describe “ignition pattern” as a pattern “in which an ignition point during the compression movement varies with operation speed of the engine.” (*Id.* at 13, col. 6:36-38; *id.* at 14, col.7:4-6.) The specification, meanwhile, describes ignition pattern as “[t]he various combinations of ignition timings and particular engine speeds.”

(*Id.* at 11, col. 2:53-55.) In view of these multiple descriptions, the Court is unwilling to adopt the one summarily proposed by Arctic Cat.

BRP's proposed construction, conversely, includes three limitations: that (1) an "ignition pattern" is a **predefined** set of ignition timing settings, (2) each set is made up of **at least two** ignition timing settings, and (3) ignition timing settings **vary exclusively** based on engine speed. The Court will discuss each proposed limitation in turn below.

To support its construction that ignition patterns are predefined, BRP notes that the claim language and specification repeatedly state that a particular ignition pattern is "selected" from a plurality of ignition patterns. (*See id.*, col. 1:49-52; *id.*, col. 2:60-63; *id.* at 13, col. 6:43-46.) BRP argues that it is impossible to select a pattern unless one already exists, meaning that ignition patterns must be predefined. (*See id.* at 12-13, col. 4:56-col. 6:14.) BRP also notes that the ignition pattern embodiments within the specification reflect predefined sets. In spite of these arguments, however, the Court will decline to import BRP's proposed limitation. First, the term "predefined" does not appear anywhere within the intrinsic evidence. Second, the claim language itself does not expressly rule out the possibility that an ignition pattern could be modified post-selection, and the other intrinsic evidence is silent on the issue. Because claim terms are generally given their ordinary and customary meaning, the Court will not import a limitation that neither appears in the intrinsic record nor is required by the claim language. A person of ordinary skill in the art simply would not understand ignition pattern to constitute a "predefined" set of ignition points.

BRP next seeks to include a limitation that each ignition pattern is comprised of at least two ignition points, and the Court is persuaded. First, the term ignition pattern itself suggests more than one ignition point – a single ignition point could not be considered a pattern. Second, the specification expressly describes an ignition pattern as “**various combinations** of ignition **timings** and particular engine speeds.” (*Id.* at 11, col. 2:53-55 (emphasis added).) Again, this language implies a pattern comprised of more than one ignition point. Third, all of the ignition pattern embodiments portray multiple ignition points. (*Id.* at 12-13, col. 4:56-col. 6:14.) In light of this intrinsic evidence, the Court finds that a person of ordinary skill in the art would necessarily understand that an ignition pattern includes at least two ignition points.

BRP lastly seeks to include a limitation that ignition timing settings vary exclusively based on engine speed. To support this construction, BRP relies heavily on the claim language, specification, and prosecution history, arguing that in each of those sources, the inventor only describes ignition timing as varying with respect to engine speed. Absent another variable, BRP contends that a person of ordinary skill in the art would understand that the relationship between ignition timing and engine speed is an exclusive one. BRP also relies on the ‘107 patent, which shares a common inventor, Greg Spaulding. BRP points out that the ‘107 patent teaches a “fuel injection map” consisting of multiple input variables. (*See* ‘107 Patent at 7, col. 4, tbl. 1; *id.* at 8, col. 6:18-23.) According to BRP, this shows that if the inventor intended for “ignition pattern” in the ‘566 patent to include more than ignition timing and engine speed, he could have used the term “ignition maps.”

But these arguments cannot succeed. First, the word “exclusively” never appears anywhere within the intrinsic evidence. *See W.E. Hall Co., Inc. v. Atlanta Corrugating, LLC*, 370 F.3d 1343, 1353 (Fed. Cir. 2004) (noting that claim construction “begins and ends in all cases with the actual words of the claim”). Second, the mere fact that the inventor described ignition pattern as involving two variables does not rule out the possibility that other variables could also be involved. Claims 1 and 8, for example, disclose that the “ignition point during the compression movement varies with operation speed of the engine” and that “ignition patterns hav[e] different relationships between ignition point and engine speed,” respectively. (‘566 Patent at 13, col. 6:36-42; *id.* at 14, col. 7:3-6, 9-13.) While this claim language undoubtedly discloses a relationship between ignition timing and engine speed, nothing about it mandates exclusivity. Moreover, Claims 1 and 8 both begin with the word “comprising” (*id.* at 13, col. 6:26, 63), which the Federal Circuit has held “is generally understood to signify that the claims do not exclude the presence in the accused apparatus or method of factors in addition to those explicitly recited,” *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 811 (Fed. Cir. 1999). Altogether, the Court finds that a person of ordinary skill in the art would not understand that an ignition pattern consists of ignition timing settings that vary exclusively based on engine speed.

Based on the above, the Court construes “ignition pattern,” as it is used within the ‘566 patent, to mean the following:

A set of at least two ignition timing settings, in which the ignition timing settings vary based on engine speed.

2. “Ignition Pattern” in the ‘082 Patent

The term “ignition pattern” (or “ignition patterns”) appears in independent Claims 1 and 8, and dependent Claims 5, 6, 12, and 13 of the ‘082 patent. Both BRP and Arctic Cat argue for the same construction that they proposed for ‘566 patent and rely on many of the same arguments. Thus, for the same reasons already explained in context of the ‘566 patent, the Court will (1) reject Arctic Cat’s proposed construction,⁴ and (2) accept BRP’s proposed limitation that ignition patterns are made up of at least two ignition timing settings.⁵ The Court will also reject BRP’s other two proposed limitations – that ignition patterns are “predefined” sets and that ignition timing settings vary exclusively based on engine speed – but for reasons in addition to those already discussed.

Regarding whether ignition patterns are “predefined” sets, the specification for the ‘082 patent expressly confirms that they need not be:

It is also possible to use the sensed temperature readings **to modify a particular timing pattern** that can be selected from a plurality of patterns. For example, the user may be able to select a timing pattern from a plurality of timing patterns using a switch or the like, and the sensed temperature readings can be used to modify the selected pattern appropriately.

(‘082 Patent at 12, col. 4:6-12.) As this written description makes clear, an ignition pattern that is subsequently modified based on sensed temperature readings is not, and

⁴ As in the ‘566 patent, the ‘082 patent includes multiple descriptions of “ignition pattern.” (See ‘082 Patent at 11-12, col. 2:67-col. 3:2; *id.* at 14, col. 7:31-33, col. 8:19-21.)

⁵ As in the ‘566 patent, the specification for the ‘082 patent refers to ignition pattern as “**various combinations** of ignition **timings** and particular engine speeds.” (*Id.* at 11-12, col. 2:67-col. 3:2 (emphasis added).) Moreover, all of the sample ignition patterns disclose more than one ignition timing point. (See *id.* at 13-14, col. 5:31-col. 7:8.)

cannot be, predefined. *See Phillips*, 415 F.3d at 1317 (“It is . . . entirely appropriate for a court, when conducting claim construction, to rely heavily on the written description for guidance as to the meaning of the claims.”). The Court thus rejects this proposed limitation.

The Court also rejects the notion that ignition timing settings must vary exclusively based on engine speed, because it is belied by the claim language. As the Federal Circuit has noted, claim construction “begins and ends in all cases with the actual words of the claim.” *W.E. Hall Co.*, 370 F.3d at 1353. And here, the claim language itself discloses a third variable besides ignition timing and engine speed: throttle position. Claim 1 of the ‘082 patent teaches “an ignition pattern in which an ignition point during the compressing movement varies with the operation speed of the engine **and throttle position.**” (‘082 Patent at 14, col. 7:31-33 (emphasis added).) And Claim 8 teaches “an ignition pattern in which an ignition point during the compression movement varies with operation speed of the engine **and throttle position** of the engine.” (*Id.*, col. 8:19-21 (emphasis added).) Because the ‘082 patent discloses three variables, it cannot be said that the relationship between two of them, ignition timing and engine speed, is exclusive. This fact overcomes any and all of BRP’s counterarguments.

Overall, based on the above, the Court will construe “ignition pattern,” as it is used within the ‘082 patent, to mean the following:

A set of at least two ignition timing settings, in which the ignition timing settings vary based on engine speed and throttle position.

3. “Ignition Pattern” in the ‘450 Patent

The term “ignition pattern” (or “ignition patterns”) appears in independent Claims 1, 9, and 17, and dependent Claims 3, 6, 8, 11, 14, 16, 18, 20, 21 of the ‘450 patent. Both BRP and Arctic Cat again argue for the same constructions discussed above, and once more rely on many of the same arguments. Thus, for the reasons already explained, the Court will (1) reject Arctic Cat’s proposed construction,⁶ and (2) accept BRP’s proposed limitation that ignition patterns are made up of at least two ignition timing settings.⁷ The Court will also reject BRP’s proposed limitation that ignition patterns are “predefined” sets.⁸ And finally, the Court will reject BRP’s proposed limitation that ignition timing settings vary exclusively based on engine speed, for all of the same reasons discussed in context of the ‘566 patent, as well as for one additional reason. The specification for the

⁶ As in the ‘566 and ‘082 patents, the ‘450 patent includes multiple descriptions of “ignition pattern.” (*See* ‘450 Patent at 12, col. 3:2-4; *id.* at 14, col. 7:39-42, col. 8:11-14, 46-48.)

⁷ As in the ‘566 and ‘082 patents, the specification for the ‘450 patent refers to ignition pattern as “**various combinations** of ignition **timings** and particular engine speeds.” (*Id.* at 12, col. 3:2-4 (emphasis added).) And again, all of the sample ignition patterns disclose more than one ignition timing point. (*See id.* at 13-14, col. 5:35-col. 7:18.)

⁸ As in the ‘082 patent, the ‘450 patent includes the same specification language that directly confirms that ignition patterns need not be predefined:

It is also possible to use the sensed temperature readings **to modify a particular timing pattern** that can be selected from a plurality of patterns. For example, the user may be able to select a timing pattern from a plurality of timing patterns using a switch or the like, and the sensed temperature readings can be used to modify the selected pattern appropriately.

(*Id.* at 12, col. 4:9-15.)

‘450 patent makes clear that the relationship between ignition timing and engine speed need not be exclusive:

In some ignition systems, the ignition timing is based only on engine speed (so-called 2-dimensional systems). In other ignition systems, timing is based on engine speed and throttle position (so-called 3-dimensional ignition systems). **Both are applicable to the present invention.** In any case, the various combinations of ignition timings and particular engine speeds thus will form a particular ignition pattern.

(‘450 Patent at 11-12, col. 2:62-col. 3:2.) This written description illustrates why the narrowing limitation proposed by BRP is inappropriate – another variable besides engine speed, such as throttle position, could also impact a particular ignition timing setting.

Based on the above, the Court will construe “ignition pattern,” as it is used within the ‘450 patent, to mean the following:

A set of at least two ignition timing settings, in which the ignition timing settings vary based on engine speed.⁹

B. “The different ignition patterns having different relationships between ignition point and engine speed” (‘566 claims 1, 8; ‘082 claims 1, 8)

“The plurality of ignition patterns having different relationships between ignition point and engine speed” (‘450 claim 8, 16, 21)

BRP argues that the above claim phrases share the same construction: “The ignition timing points for different ignition patterns differ from each other in a non-uniform manner across the range of engine speeds.” BRP contends that this construction “clarifies” the meaning of the claims by specifying that ignition patterns differ from each

⁹ In the subsequent claim groupings below, “ignition pattern” shall have the corresponding meaning ascribed to it within this section.

other in a **non-uniform manner**. To support this construction, BRP relies on the prosecution history for the '566 patent. BRP argues that during the prosecution, Arctic Cat distinguished its invention from the Morikawa patent¹⁰ by explaining that the Morikawa patent utilized ignition timing points that applied “uniformly across the engine speed,” whereas its invention selects “one of the plurality of different ignition patterns.” (Farco Decl., Ex. 7 at 51-52, Dec. 7, 2015, Docket No. 230.) Based on this distinction, BRP argues for a construction that includes the phrase “non-uniform manner.”

The Court, however, is not persuaded. First, neither the phrase “non-uniform manner” nor any other similar or suggestive language appears anywhere within the three patents at issue. Inclusion of the phrase would thus conflict with the maxim that claim construction “begins and ends in all cases with the actual words of the claim.” *W.E. Hall Co., Inc.*, 370 F.3d at 1353.

Second, to the extent that BRP is making a disclaimer argument, the Court finds that this argument fails. For the doctrine of prosecution history disclaimer to apply, the patentee must “unequivocally and unambiguously disavow a certain meaning to obtain a patent.” *Biogen Idec*, 713 F.3d at 1094 (citing *Omega Eng'g*, 334 F.3d at 1323). This standard is not met if “a prosecution argument is subject to more than one reasonable interpretation.” *SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1287 (Fed. Cir. 2005). And here, the Court can surmise another reasonable interpretation of the prosecution history cited by BRP. For example, the Court finds it equally plausible that

¹⁰ U.S. Patent No. 5,050,551. (Farco Decl., Ex. 3, Dec. 7, 2015, Docket No. 230.)

Arctic Cat distinguished the ‘566 patent by arguing that it discloses a plurality of ignition patterns that vary based on engine speed, whereas the Morikawa patent effectively discloses only one ignition pattern that does not vary based on engine speed. (*See* Farco Decl., Ex. 7 at 51-52.) Under this interpretation, it is entirely possible that some ignition patterns contemplated by the ‘566 patent could differ in a uniform manner. Accordingly, prosecution history disclaimer cannot apply – there is no unequivocal and unambiguous disavowal.

Having rejected BRP’s proposed “clarification,” the Court turns to Arctic Cat’s proposed construction. Arctic Cat argues that a person of ordinary skill in the art would understand the disputed claim terms as they are written, rendering further construction unnecessary. The Court agrees. The purpose of claim construction is to resolve genuine disputes about the meaning and scope of claim terms. *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008). Here, the Court has already resolved the only apparent dispute – whether to include the phrase “non-uniform manner.” The remainder of BRP’s proposed construction merely rephrases the claim language, and “merely rephrasing or paraphrasing the plain language of a claim by substituting synonyms does not represent genuine claim construction.” *C.R. Bard*, 388 F.3d at 863. The Court thus finds that the claim terms as written have a plain and ordinary meaning readily apparent to one of ordinary skill in the art and accordingly do not require any additional construction.

- C. **“The particular ignition pattern used by the controller being selected based upon the sensed exhaust gas temperature” (‘566 claim 1; ‘082, claim 1)**

“The controller selects an ignition pattern based on the sensed exhaust gas temperature” (‘450 claim 1)

“The controller being configured to selecting an ignition pattern based on the output of the temperature sensor” (‘107 claim 19)

BRP argues that all of the above claim phrases should have same construction: “The particular ignition pattern used by the controller being selected for a particular engine operating condition as indicated by the sensed exhaust gas temperature, and not for controlling the exhaust gas temperature to optimize performance of exhaust system components.” This construction includes two proposed disclaimers: (1) the controller selects an ignition pattern for “a particular engine operating condition as indicated by the sensed exhaust temperature,” and (2) the controller does **not** select an ignition pattern “for controlling the exhaust gas temperature to optimize performance of exhaust system components.” Arctic Cat, on the other hand, argues that no construction is necessary because the claims, as written, have a plain and ordinary meaning.

In general, there is a “‘heavy presumption’ that claim terms carry their full ordinary and customary meaning.” *Biogen Idec*, 713 F.3d at 1095 (quoting *Omega Eng’g*, 334 F.3d at 1326). However, as noted above, “when the patentee unequivocally and unambiguously disavows a certain meaning to obtain a patent,” this heavy presumption is overcome and “the doctrine of prosecution history disclaimer narrows the meaning of the claim consistent with the scope of the claim surrendered.” *Id.* (citing *Omega Eng’g*, 334 F.3d at 1324). Here, the key question is whether the inventor

unequivocally and unambiguously limited the scope of the patents in the manner that BRP suggests.

Beginning with the ‘566 patent, the first patent to issue, the Court answers this question in the affirmative – prosecution history disclaimer applies. During prosecution of the ‘657 parent application, which ultimately issued as the ‘566 patent, the patent examiner initially rejected Claims 1, 3, 4, 6, 8, and 9 “as being anticipated by Morikawa.” (Farco Decl., Ex. 7 at 42.) The patent examiner noted, among other things, that Morikawa also taught “a 2-stroke engine wherein the ignition timing is adjusted depending on exhaust temperature.” (*Id.*) In response, the inventor expressly distinguished the inventions by arguing that “the purpose of Morikawa is completely different from that of the present invention and the system of Morikawa in no way suggests that of the present claims.” (*Id.* at 52.) The inventor then explained the differing purposes: “While the present invention uses exhaust gas temperature **as an indicator of particular engine conditions that may require different ignition patterns**, Morikawa intends to modify engine operation **to obtain a desired exhaust temperature**” in order to maintain “suitable performance of a catalytic converter.” (*Id.* at 51-52 (emphasis added).) The patent examiner subsequently filed a notice of allowability, and the ‘566 patent eventually issued. (*See id.* at 53.) In the Court’s view, this exchange constitutes unequivocal and unambiguous disclaimer regarding the scope of the ‘566 patent – (1) sensed exhaust gas temperature is used as an indicator of engine

conditions,¹¹ and (2) the controller does not select an ignition pattern for modifying the exhaust gas temperature in order to maintain suitable performance of a catalytic converter.¹²

The next question is whether these two disclaimers also apply to the ‘082 and ‘450 patents. For the reasons that follow, the Court finds that they do. First, the specifications for both patents expressly disclose that “the exhaust gas temperature is used to evaluate operating conditions and thus determine which of two or more ignition patterns should be selected for engine operation.” (‘082 Patent at 12, col. 3:7-10; ‘450 Patent at 12, col. 3:9-12.) Second, during prosecution of the ‘082 patent, the inventor reaffirmed that exhaust gas temperature is used an indicator of engine conditions. When the patent examiner

¹¹ The specification also supports the existence of this first disclaimer. *Phillips*, 415 F.3d at 1316 (noting that the specification “may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor”). In the Detailed Description section, the inventor explained:

Different engine operating conditions may result in different ignition patterns being desirable. That is, in one circumstance one particular ignition pattern may be the most useful, while another pattern might be better under different conditions. In accordance with the present invention, **the exhaust gas temperature is used to evaluate operating conditions and thus determine which of two or more ignition patterns should be selected for engine operation.** For this purpose, an exhaust gas temperature sensor **24** is provided.

(‘566 Patent at 11, col. 2:56-64 (first emphasis added).)

¹² BRP proposes a slightly different disclaimer: the controller does not select an ignition pattern for controlling the exhaust gas temperature **to optimize performance of exhaust system components**. But this is too broad. The Morikawa patent discloses an ignition timing system that controls exhaust gas temperature in order to maintain suitable performance of a catalytic converter, not “exhaust system components” generally. The Court will therefore apply a variation of BRP’s proposed disclaimer, but one that is tailored to the disclaimer the inventor actually made.

rejected the '082 patent as being anticipated by the Wahl patent, the inventor explained that

in the present invention, the **exhaust temperature is used as indicative of a particular engine condition** for which a particular ignition pattern may be desirable

In contrast, Wahl merely teaches that ignition timing on a four stroke engine can be controlled electronically by sensed properties that are converted to electric voltages.

(Farco Decl., Ex. 8 at 54 (emphasis added).)

Third, and perhaps most significantly, the '566, '082, and '450 patents are all a part of the same patent family, and there is no indication that the common inventor, Greg Spaulding, intended for the later-issued patents to have a different scope than the '566 patent. As the Federal Circuit has noted, “the prosecution history regarding a particular limitation in one patent is presumed to inform the later use of that same limitation in related patents, ‘unless otherwise compelled.’” *Trading Techs. Int’l, Inc. v. Open E Cry, LLC*, 728 F.3d 1309, 1323 (Fed. Cir. 2013) (quoting *Omega Eng’g*, 334 F.3d at 1333). Here, there is no reason to be otherwise compelled. The claim phrase in the '082 patent is identical to the one appearing in the '566 patent, and the claim phrase in the '450 patent is not materially different. *Cf. Saunders Grp., Inc. v. Comfortrac, Inc.*, 492 F.3d 1326, 1333 (Fed. Cir. 2007) (finding that prosecution disclaimer directed toward specific claim term does not apply to descendant patent when claim term has been “materially altered”). Moreover, the claim phrases are directed towards the same subject matter with generally the same functionality – a two-stroke engine that measures exhaust gas temperature to control ignition timing. Finally, the inventor never rescinded the

disclaimers during the subsequent prosecutions. *See Hakim v. Cannon Avent Grp., PLC*, 479 F.3d 1313, 1318 (Fed. Cir. 2007) (“Although a disclaimer made during prosecution can be rescinded, permitting recapture of the disclaimed scope, the prosecution history must be sufficiently clear to inform the examiner that the previous disclaimer, and the prior art that it was made to avoid, may need to be re-visited.”). Based on this, the Court concludes that BRP’s proposed disclaimers apply to the ‘082 and ‘450 patents.

The final issue is whether the disclaimers should also apply to Claim 19 of the ‘107 patent. The Court concludes that they do not. First, although the ‘107 patent is associated with the ‘566, ‘082, and ‘450 patents, it is not a part of the same patent family. Second, BRP has not cited anything within the intrinsic evidence suggesting unequivocal and unambiguous disclaimer – indeed, BRP did not even specifically mention Claim 19 in its briefing or at the hearing. Absent unequivocal and unambiguous evidence, the Court cannot find that the proposed disclaimers attach. The Court will therefore construe Claim 19 of the ‘107 patent in the manner proposed by Arctic Cat: its plain and ordinary meaning as written.

Overall, the Court will construe each claim as follows:

Claim 1 of the ‘566 and ‘082 patents

The particular ignition pattern used by the controller being selected for a particular engine operating condition as indicated by the sensed exhaust gas temperature, and not for controlling the exhaust gas temperature to maintain suitable performance of a catalytic converter.

Claim 1 of the ‘450 patent

The controller selects an ignition pattern for a particular engine operating condition as indicated by the sensed exhaust gas temperature, and not for

controlling the exhaust gas temperature to maintain suitable performance of a catalytic converter.

Claim 19 of the '107 patent

The controller being configured to selecting an ignition pattern based on the output of the temperature sensor.

D. “Selecting the ignition pattern from a plurality of different ignition patterns based on the sensed exhaust gas temperature” (‘566 claim 8; ‘082 claim 8)

“Selecting an ignition pattern from a plurality of ignition patterns based on the sensed exhaust temperature” (‘450 claim 9)

“Selecting a desired ignition pattern based on the sensed exhaust gas temperature” (‘450 claim 17)

The parties reprise the same arguments for these claim phrases that they advanced for the claim phrases in the immediately preceding section of this Order. Thus, for the same reasons explained above, the Court will adopt the two disclaimers proposed by BRP. However, because these are method claim phrases, whereas the claim phrases in the preceding section are apparatus claim phrases, the Court will employ a different grammatical structure. But the meaning is intended to be the same.

Claim 8 of the ‘566 and ‘082 patents

Selecting the ignition pattern from a plurality of different ignition patterns for a particular engine operating condition as indicated by the sensed exhaust gas temperature, and not for controlling the exhaust gas temperature to maintain suitable performance of a catalytic converter.

Claim 9 of the ‘450 patent

Selecting an ignition pattern from a plurality of ignition patterns for a particular engine operating condition as indicated by the sensed exhaust gas

temperature, and not for controlling the exhaust gas temperature to maintain suitable performance of a catalytic converter.

Claim 17 of the '450 patent

Selecting a desired ignition pattern for a particular engine operating condition as indicated by the sensed exhaust gas temperature, and not for controlling the exhaust gas temperature to maintain suitable performance of a catalytic converter.

E. “The controller activating the ignition source according to an ignition pattern” (‘566 claim 1; ‘082 claim 1)

“Controlling the activation of the ignition source according to an ignition pattern” (‘566 claim 8, ‘082 claim 8)

“Controlling the activation of the ignition source according to the selected ignition pattern” (‘450 claims 9, 17)

The parties again reprise the same arguments concerning these claim phrases that they advanced for the claim phrases in the preceding two sections of this Order. Thus, for the same reasons explained above, the Court will adopt the two disclaimers proposed by BRP. The Court will once more grammatically tailor its constructions to conform to the claim language, but without intent to alter the meaning.

Claim 1 of the ‘566 and ‘082 patents

The controller activating the ignition source according to an ignition pattern, the ignition pattern being selected for a particular engine operating condition as indicated by the sensed exhaust gas temperature, and not for controlling the exhaust gas temperature to maintain suitable performance of a catalytic converter.

Claim 8 of the ‘566 and ‘082 patents

Controlling the activation of the ignition source according to an ignition pattern, the ignition pattern being selected for a particular engine operating condition as indicated by the sensed exhaust gas temperature, and not for

controlling the exhaust gas temperature to maintain suitable performance of a catalytic converter.

Claims 9 and 17 of the '450 patent

Controlling the activation of the ignition source according to the selected ignition pattern, the ignition pattern being selected for a particular engine operating condition as indicated by the sensed exhaust gas temperature, and not for controlling the exhaust gas temperature to maintain suitable performance of a catalytic converter.

F. “A temperature sensor coupled to the exhaust port of the cylinder to measure exhaust gases” (‘107 claim 1)

“Measuring the temperature of the exhaust gases from an exhaust port of the cylinder” (‘107 claim 11)

“A temperature sensor for sensing a temperature of exhaust gases from the exhaust port of the cylinder” (‘107 claim 15)

BRP proposes that each of the above claim phrases should have the following construction: “A temperature sensor located at the cylinder exhaust port that measures the temperature of the gases that resulted from combustion of fuel-air mixture in the cylinder.” This construction includes two specific limitations: (1) that the temperature sensor is located exclusively at the cylinder exhaust port, and (2) that the sensor measures the temperature of gases resulting from combustion of fuel-air mixture in the cylinder. Arctic Cat, conversely, argues that no construction is necessary because all three claim phrases have a plain and ordinary meaning that would be fully apparent to a person of ordinary skill in the art. The Court will address the parties’ arguments below.

To support its proposed construction regarding the location of the temperature sensor, BRP relies on the prosecution history. BRP argues that Arctic Cat distinguished

the ‘107 patent from the Morikawa patent by specifying that the sensor is located at the cylinder exhaust port and not somewhere further downstream in the exhaust system. The Court, however, is not convinced by this interpretation. As far as the Court can tell, Arctic Cat never specifically defined the precise location of the temperature sensor at any time during the prosecution history, and instead distinguished the ‘107 patent by contrasting the operability of the invention’s sensor. The inventors noted in their response to the examiner’s rejection of their original claims that the Morikawa patent contemplated a sensor that is only operable “during a limited time during engine operation” when the exhaust gas temperature is lower than the temperature necessary for “activating a catalyst in a catalytic converter.” (Farco Decl., Ex. 16 at 41-42.) The ‘107 patent, on the other hand, teaches a temperature sensor that functions during additional operating conditions, without any connection to a catalytic converter. (*Id.*) This distinction does not mandate, as BRP argues, a particular location for the temperature sensor.

The specification for the ‘107 patent further belies BRP’s proposed construction. In the detailed description of the preferred embodiment, the inventor described the temperature sensor as being “positioned in or near an exhaust pipe . . . coupled to the exhaust port.” (‘107 Patent at 6, col. 2:59-61.) This language, in and of itself, directly contradicts the notion that the sensor must be located at the exhaust port and not somewhere further downstream. Figure 1, which visually depicts the preferred embodiment, also portrays the sensor as being located within the exhaust pipe and not on the exhaust port. (*Id.* at 3, fig. 1; *id.* at 6, col. 2:59-62.)

Finally, the claim language itself does not support BRP's proposed construction. Although Claim 1 describes the sensor as being "coupled" to the exhaust port of the cylinder, and Claims 11 and 15 specify that temperatures are measured "from" the exhaust port, the Court does not interpret this language as mandating that the sensor be located at the exhaust port. As the preferred embodiment makes clear, the sensor could also be attached to an exhaust pipe that is coupled to the exhaust port. (*Id.* at 3, fig. 1; *id.* at 6, col. 2:59-62.) Thus, while the claims certainly allow for the sensor to be located at the cylinder exhaust port, they do not require it.

Based on the above, the Court will decline to adopt BRP's restrictive construction regarding the location of the sensor. Instead, the Court will adopt a more open-ended construction: The temperature sensor is located in or near the exhaust port of the cylinder **or** in or near an exhaust pipe coupled to the exhaust port. This construction is consistent with the claim language and preferred embodiment, does not contradict the prosecution history, and reflects what a person of ordinary skill in the art would understand from the intrinsic evidence.¹³

BRP next seeks to include a limitation that the temperature sensor "measures the temperature of the gases that resulted from combustion of fuel-air mixture in the cylinder." BRP again relies on the prosecution history, arguing that the inventor

¹³ Arctic Cat argues that no construction is necessary, but the Court disagrees. The purpose of claim construction is to resolve disputes regarding the meaning and scope of claim terms, and the parties dispute the location of the temperature sensor, making construction necessary.

distinguished the '107 patent from the Morikawa patent by specifying that the sensor only measures exhaust gas temperature immediately after combustion and before the exhaust gas moves downstream in the exhaust system and changes temperature. The Court, however, finds no support for this construction in the prosecution history. Simply put, Arctic Cat never made this argument to the patent examiner. Instead, BRP's proposed construction rests entirely on its assumption, which the Court already rejected above, that the temperature sensor must be located at the exhaust port. If that were the case, then the sensor of course could not measure the temperature of the exhaust gas further downstream. But because the Court has already construed the claims as allowing the sensor to be located in or near an exhaust pipe coupled to the exhaust port, BRP's downstream argument fails. The Court will therefore decline to include BRP's desired limitation.

Overall, the Court will construe each claim as follows:

Claim 1

A temperature sensor, which is located in or near the exhaust port of the cylinder or in or near an exhaust pipe coupled to the exhaust port, that measures the temperature of exhaust gases.

Claim 11

Measuring the temperature of the exhaust gases using a sensor located in or near the exhaust port of the cylinder or in or near an exhaust pipe coupled to the exhaust port.

Claim 15

A temperature sensor, located in or near the exhaust port of the cylinder or in or near an exhaust pipe coupled to the exhaust port, for sensing a temperature of exhaust gases.

G. “Normal operating conditions” (‘107 claims 1, 11, 15)

“Low temperature operating conditions” (‘107 claims 1, 11, 15)

BRP lastly argues that the claim phrases “normal operating conditions” and “low temperature operating conditions” lack reasonable certainty and are therefore indefinite and not amenable to construction. These phrases appear in Claims 1, 11, and 15 of the ‘107 patent.

35 U.S.C. § 112 requires patent claims to be sufficiently definite. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). In *Nautilus*, the Supreme Court determined that a patent claim is indefinite if it fails to “inform those skilled in the art about the scope of the invention with reasonable certainty” when “viewed in light of the specification and prosecution history.” *Id.* Section 112’s definiteness requirement thus “mandates clarity, while recognizing that absolute precision is unattainable.” *Id.*

BRP makes two main arguments regarding indefiniteness. First, it contends that the objects of the two phrases are unknown – in other words, normal or low temperature operating conditions of what? Second, it argues that the intrinsic evidence does not specify what constitutes normal or low temperature operating conditions, and also does not provide objective boundaries for determining the scope of the phrases. The Court will address each argument separately below.

1. Unknown Objects

The crux of BRP's first argument is that the phrases are ambiguous and thus indefinite because a person of ordinary skill in the art would be unable to determine what the phrases are referring to. Arctic Cat, on the other hand, argues that the phrases clearly refer to a two-stroke engine.

BRP's argument rests on two bases. First, BRP notes that the claim phrases appear in limitations that introduce the "control unit." (*See* '107 Patent at 8, col. 6:12; *id.* at 9, col. 8:7.) According to BRP, this suggests that the phrases refer to the normal and low temperature operating conditions of the control unit. Second, BRP points to a passage within the specification that ostensibly links the phrases to an engine. (*Id.* at 7, col. 3:21-26.) Based on this incongruity, BRP contends that a person of ordinary skill in the art would be unable to determine the phrases' true object – the control unit or the engine. But the Court rejects this argument and finds, as Arctic Cat argues, that the phrases refer, with reasonable certainty, to a two-stroke engine.

Most significantly, Claims 1, 11, and 15 all begin with a reference to a "two-stroke" or "two-cycle" engine. (*Id.* at 8, col. 6:2; *id.* at 9, col. 7:1, 47.) Thus, when read in full context, it is reasonably clear that the phrases refer to the operating conditions of the engine rather than the control unit. The specification also supports this construction, directly linking the phrases to the engine: "Experiments conducted by the inventors have indicated that low emissions and smooth **engine** performance are possible at **normal operating conditions** with a lean fuel-air mixture in the cylinder 12. In contrast, at

lower operating temperatures a richer fuel-air mixture may enable the **engine** to accelerate without hesitation.” (*Id.* at 7, col. 3:21-26 (emphasis added).)

In light of this unambiguous intrinsic evidence, the Court concludes that a person of ordinary skill in the art would understand that the phrases at issue refer to a two-stroke engine.

2. No Definite Meaning or Objective Boundaries

BRP’s second argument is that “normal” and “low temperature” – both terms of degree – lack specificity because they have no discernable objective boundaries. For the reasons that follow, the Court agrees.

Although “terms of degree are [not] inherently indefinite,” such terms must have reasonably ascertainable “objective boundaries” to a person skilled “in the art when read in the context of the invention.” *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1370-71 (Fed. Cir. 2014), *cert. denied*, 136 S. Ct. 59 (2015). Absent objective boundaries, a term of degree is indefinite because it fails to give “clear notice of what is claimed, thereby appris[ing] the public of what is still open to them.” *Id.* at 1370 (alteration in original) (quoting *Nautilus*, 134 S. Ct. at 2129). Thus, it is not enough that “a court can ascribe **some** meaning to a patent’s claims.” *Id.* (quoting *Nautilus*, 134 S. Ct. at 2130). Instead, to satisfy § 112’s definiteness requirement, the term, “when viewed in light of the specification and prosecution history,” must “inform those skilled in the art about the scope of the invention with reasonable certainty.” *Id.* at 1374 (quoting *Nautilus*, 134 S. Ct. at 2129).

Here, the ‘107 patent does not provide any objective boundaries for determining what constitutes “normal” or “low temperature” operating conditions. Claim 1, for example, teaches a control unit that is “operable during normal operating conditions and during low temperature operating conditions.” (‘107 Patent at 8, col. 6:13-15.) The fact that the control unit is operable during these two operating conditions implies that there are other operating conditions when the control unit is not operable (e.g., during high temperature operating conditions). But the claim language, specification, and prosecution history do not provide any further guidance on what those other operating conditions might be. There are no references to any temperature ranges or numerical values, or any boundaries to distinguish normal from abnormal or low temperature from any other temperature. Simply put, a person skilled in the art would have no basis for defining or measuring what constitutes normal or low temperature operating conditions, as those terms are used in the ‘107 patent.

Arctic Cat argues that “normal” is not indefinite because it appears within patents incorporated by reference into the ‘107 patent, including the ‘566, ‘082, and ‘450 patents. But this argument is unavailing. While it is true that the word “normal” appears in the specifications for these patents, it is not reasonably clear that the term was intended to have the same meaning across all four patents. In the ‘566, ‘082, and ‘450 patents, “normal” is used in the following context: “Thus, as one example the optimum point of ignition during acceleration can differ from that for a normal running operation.” (‘566 Patent at 11, col. 1:20-22; ‘082 Patent at 11, col. 1:27-29; ‘450 Patent at 11, col. 1:29-31.) In that context, a person skilled in the art might understand “normal” to mean any time

the engine is running but not accelerating. In the ‘107 patent, however, there is nothing to indicate that “normal” means the same thing. Indeed, “normal” operating conditions equally could be referring to the outside temperature, the exhaust gas temperature, terrain conditions, some other variable, or some combination of these variables. Thus, the mere fact that “normal” appears in the ‘566, ‘082, and ‘450 patents does not offer reasonably certain objective boundaries for its use in the ‘107 patent.

Arctic Cat additionally argues that “normal” and “low temperature” are definite because they appear in prior art cited on the face of the ‘107 patent during prosecution, including the Morikawa and Kato¹⁴ patents. But again, this argument is unavailing.

During prosecution for the ‘107 patent, the inventor distinguished the invention from the Morikawa patent by noting that Morikawa discloses a control unit that is “only” operable when the temperature of the exhaust gas is lower than the lower limit necessary “for activating a catalyst in a catalytic converter,” whereas the ‘107 patent discloses a control unit that is operable at other times, including during “normal operating conditions.” (Farco Decl., Ex. 16 at 41.) While this prosecution history references the terms at issue, it falls short of providing objective boundaries. First, although the Morikawa patent suggests that “low temperature” might mean the exhaust gas temperature necessary to activate a catalyst in the catalytic converter, the ‘107 patent does not actually disclose or teach the use of a catalytic converter. Thus, a person skilled

¹⁴ U.S. Patent No. 6,367,450. (Decl. of Niall A. MacLeod, Ex. A, Dec. 30, 2015, Docket No. 235.)

in the art could not be sure, with reasonable certainty, that the Morikawa construction transfers to the ‘107 patent. Second, neither the Morikawa patent nor the prosecution history provide any guidance on the meaning of “normal.” While the term is used, there are no discernable reference points upon which to construe objective boundaries.

Arctic Cat’s citation to the Kato patent is equally ineffective. Although “normal” and “low” appear repeatedly throughout the Kato patent’s specification, there is no indication that the terms – as used within that patent – share a common meaning with the ‘107 patent. In all of the citations provided by Arctic Cat, the terms relate to either (1) a temperature sensor located on a fuel injector nozzle that is used to measure the operating temperature of the cylinder, (2) speed, or (3) the power output of the cylinder. (*See* Arctic Cat’s Response Brief at 9-10.) By contrast, nothing in the ‘107 patent discloses or teaches a comparable fuel injector nozzle, and there is nothing to suggest that the terms relate to speed or the power output of the cylinder. Instead, “normal” and “low temperature” relate to the operating conditions of the engine generally. Accordingly, one skilled in the art could not simply transpose a definition from the Kato patent into the ‘107 patent – the terms as used have entirely different objects.

Arctic Cat next argues that “normal” and “low temperature” cannot be indefinite because the patent examiner did not reject either term as such during prosecution. But if the Court were to accept this argument, no party could ever raise an indefiniteness challenge because every claim term ever held indefinite was originally approved by a patent examiner.

Arctic Cat additionally relies on several cases for the proposition that “low” is not indefinite. But the cases that Arctic Cat relies upon are distinguishable – the intrinsic evidence in those cases actually provided a standard for measuring the meaning of the term. In *CardioFocus, Inc. v. Cardiogenesis Corp.*, for example, the court found that “low hydroxyl ion content” was not indefinite because the specification “provide[d] an express standard against which to measure ‘low.’” 827 F. Supp. 2d 36, 43-44 (D. Mass. 2011). In *NexMed Holdings, Inc. v. Beta Techs., Inc.*, the court found that “low DC voltage” and “low DC electrical voltage” were not indefinite because an embodiment in the specification disclosed an exact voltage amount. No. 2:06-1014, 2008 WL 2783522, at *4 (D. Utah July 16, 2008). And in *Input/Output, Inc. v. Sercel, Inc.*, the court found that “low frequency forces” was not indefinite because the specification provided a numerical example of a low frequency range. No. 5:06-236, 2007 WL 6196070, at *30 (E.D. Tex. Dec. 19, 2007). Here, by contrast, Arctic Cat has pointed to no standard within the intrinsic evidence that a person skilled in the art could use to measure the objective boundaries of “normal” or “low temperature” operating conditions. This necessitates a finding of indefiniteness.

Arctic Cat lastly relies on extrinsic evidence, arguing that BRP’s own witnesses – Bruno Schuehmacher and Glenn Bower – understood the meaning of “normal” and “low temperature” operating conditions. See *Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1367 (Fed. Cir. 2003) (stating that a district court should only consider extrinsic evidence on an indefiniteness challenge if there is “still some genuine ambiguity in the claims,

after consideration of all available intrinsic evidence”). But a close examination of the relevant deposition testimony belies this argument.

Schuehmacher, for example, answered general questions about “normal” operating conditions, but never testified as to any objective boundaries for measuring what “normal” means. (MacLeod Decl., Ex. Q at 49:18-24, 51:10-25.) Quite to the contrary, one of his answers actually suggests uncertainty about the scope of the term. When asked if he could “think of any other times where you would expect high exhaust gas temperature during normal operating conditions,” Schuehmacher responded: “Well, **if you consider as being normal** a situation . . . where there might be an air leak in the exhaust gas system or a problem with the – a problem with the gas supply or the gas system – gas supply system.” (*Id.* at 51:18-25.) Arctic Cat also argues that Schuehmacher’s testimony provides a definition for “low temperature.” Yet the testimony that Arctic Cat relies upon was not even directed towards “low temperature” as it appears in Claims 1, 11, and 15. Instead, Schuehmacher was asked about why “combustion stop[s] when the throttle is opened to the maximum.” (*Id.* at 104:13-15.) Nothing about this question, or Schuehmacher’s answer, suggests a linkage to term at issue in the ‘107 patent. (*See id.* at 104:16-25.)

Bowers’ testimony is similarly unavailing. Most significantly, Bowers was not actually testifying about the ‘107 patent and was instead answering questions about an entirely different patent. (*See id.*, Ex. R at 185:12-14 (discussing a patent entitled “Post Injections During Cold Operation”).) This draws into question whether his testimony is relevant to the terms as they are used in the ‘107 patent. Yet even if the Court were to

assume that Bowers' testimony was relevant, it does not establish that "normal" and "low temperature" are definite. Bowers' simple acknowledgement that he knows what "normal operating conditions are in a snowmobile engine" sheds no light on what the term means in context of the '107 patent. (*Id.* at 186:21-23.) And his discussion of "'cold operation' with respect to internal combustion engines" similarly sheds no light on the meaning of "low temperature" operating conditions. (*Id.* at 185:17-186:5, 187:2-6.) For one, the Court would have to assume that "cold operation" means the same thing as "low temperature" operating conditions. Moreover, Bowers admitted that "cold operation" could have two different meanings: either (1) the "system for warming an engine up when it was first started," or (2) when "the exhaust temperatures are not high enough to activate the catalyst." (*Id.* at 185:20-186:15.) Here, there is nothing to definitively indicate that the '107 patent relates to either of these definitions. Bowers' testimony thus has no reasonably certain bearing on the terms at issue.

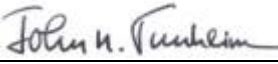
Altogether, the Court finds that the claim terms "normal" and "low temperature," when viewed in the light of the intrinsic and extrinsic evidence, fail to inform those skilled in the art about the scope of the '107 patent with reasonable certainty. While it is true that terms of degree are not inherently indefinite and § 112 does not require "absolute or mathematical precision," neither the intrinsic evidence nor the extrinsic evidence provide any objective boundaries for determining what constitutes "normal" or "low temperature." And notably, not even Arctic Cat has proffered a standard for measuring what the terms mean. Accordingly, the Court concludes that "normal

operating conditions” and “low temperature operating conditions” are indefinite under § 112.¹⁵

ORDER

Based on the foregoing, all the files, records, and proceedings herein, the Court hereby **ADOPTS** the construction of the claim terms and phrases within the ‘566, ‘082, ‘450, and ‘107 patents as set forth in the Memorandum accompanying this Order.

DATED: November 18, 2016
at Minneapolis, Minnesota.

s/ 

JOHN R. TUNHEIM
Chief Judge
United States District Court

¹⁵ This finding of indefiniteness has implications for the validity of ‘107 patent. But the Court will decline at this time to take the next step and decide whether some or all of the ‘107 patent is invalid because the parties have only asked the Court to construe disputed claim terms and phrases.